



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Docket No.: 1454.1197

#17
4-28-03
Robert
Response

Re the Application of:

Guido REECK et al.

Serial No. 09/581,712

Group Art Unit: 2835

Confirmation No. 4663

Filed: October 16, 2000

Examiner: Gregory D. Thompson

For: A COOLING DEVICE FOR ELECTRICAL SUBASSEMBLIES

RESPONSE

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

In response to the Final Office Action mailed December 17, 2002, and having a period for response set to expire on March 17, 2003, an RCE is being submitted herewith. A Petition for a one-month extension of time, together with the requisite fee for same, is also submitted herewith, thereby extending the period for response to April 17, 2003. The following remarks are respectfully submitted.

In the Office Action the Examiner noted that claims 1-8 and 10-19 were pending in the application. The Examiner allowed claims 18 and 19, objected to claims 6 and 15 and rejected the remaining claims. Thus, claims 1-8 and 10-19 are pending in the application. The Examiner's rejections are traversed below.

Rejection Based on U.S. Patent 6,008,454 to Kawakita

In item 2 on page 2 of the Office Action the Examiner has maintained the rejection of claims 1, 7 and 8 under 35 U.S.C. §102 as anticipated by Kawakita. The Examiner makes reference to a filter 16.

Referring to Figures 1 and 2, Kawakita is directed to a storage box for electronic control units. The storage box employs an inner box 11 surrounded by an outer box 12. The inner box 11 has a storage section 11b which houses an electronic control unit 20. A filter opening 11g in

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the inner box 11 is sealed with a filter 16 which allows air to pass but not water (see claim 2). Apart from the filter opening 11g, the inner box 11 is sealed with respect to the outside. A grommet hole 11h provides electrical connection for the electronic control circuit 20 but is also sealed to the outside. Inner box 11 is built within the outer box 12. The outer box 12 provides an intake opening 12b (Figure 1) for connection to an air conditioning device or open to the outside air. Air introduced through intake opening 12b flows through spaces 15 and 14 between the outer box 12 and the inner box 11, and exits through an exhaust opening 11d of the outer box 12. Because there is an outer box surrounding the inner box, there is no problem with dust particles intruding into the inner box. This is prevented by the outer box and not by the filter 16.

Because the present claimed invention is based on a single housing, the appropriate comparison is with the inner box 11 of Kawakita. Kawakita discloses that the inner box 11 provides only one opening 11g which forms a connection between the inner box and the outer box. This opening 11g serves as both an air inlet and an air outlet. This is in contrast to the present invention which provides both an air inlet and a separate air outlet.

Heat produced by the electronic control unit 20 in the inner box 11 of Kawakita results in a higher pressure in the inner box compared to the air in the outer box. As a result, hot air escaping from the inner box will prevent cooling air from entering the inner box. To provide an active cooling of the electronic device within the inner box by an airflow, an active cooling system that builds up an airflow is needed. Otherwise, the cooling in the inner box can only be regarded as passive cooling, mainly serving to reduce the over pressure in the inner box due to the higher temperature. Kawakita does not provide such an active cooling device for building up an airflow within the inner box. In contrast, the present claimed invention provides active cooling with a cooling device for building up an airflow in the housing, so that cool air from the environment of the housing flows through the membrane filter into the housing. Thus cool air is heated up by contacting the electrical subassemblies in the housing, and flows out of the housing through an air outlet. In summary, it is submitted that Kawakita does not provide a separate air inlet and air outlet, nor does it provide an active cooling device which forces air to the filter into the housing.

In summary, referring to claim 1, Kawakita does not teach or suggest:

“...at least one water-repellent membrane filter arranged in an air inlet of the housing for surface filtration of dirt particles from

cooling air flowing into the housing for cooling the electrical subassemblies; and

at least one cooling device to build up an airflow in the housing and to lead the filtered cooling air, which is heated up because of flowing through the electrical subassemblies, out of the housing through at least one air outlet."

Therefore, it is submitted that claim 1 patentably distinguishes over Kawakita.

Claims 7 and 8 depend from claim 1 and include all of the features of that claim plus additional features which are not taught or suggested by the prior art. Therefore, it is submitted that claims 7 and 8 also patentably distinguish over the prior art.

Prior Art Rejection Based on Ghorbani et al. and Kobayashi

In item 2 on page 2 of the office Action, the Examiner has maintained the rejection of claims 1-5, 7-8, 10-14 and 16-17 under 35 U.S.C. §103 as unpatentable over Ghorbani et al. in view of Kobayashi.

Ghorbani et al. is directed to an outside telecommunications equipment enclosure having a hydrophobic vent. Figure 3 which is an exploded view of a hydrophobic vent, is described from column 2, line 50 to column 4, line 47. As described therein, the filtering of dust particles and liquids is done in two stages. In the first stage, dust particles are filtered by a screen 34 which is positioned on an exterior side of the enclosure. The screen is a wire mesh made of plastic, aluminum or stainless steel. In the second stage, a filter sheet 38 including hydrophobic material 40 prevents liquids from passing through. The filter sheet 38 maintains the position of the circular hydrophobic material 40 in the correct position with respect to circular openings 30 in the enclosure. It is clear that the dust particle screen 34 is outside of the enclosure. Further, the filter sheet 38 has no filtering functionality other than by virtue of the hydrophobic material 40 which only filters liquids. See column 3, lines 31-32 which state that this material is used "to prohibit liquids from passing therethrough."

The Kobayashi patent is directed to a filter for air cleaning which includes a layer of water repellent fiber and a layer in which fiber bundles comprise aggregates of water-absorbent fibers. The filter is used for cleaning outside air to be taken into factories, buildings, etc. particularly to remove salt particles contained in the outside air in coastal areas. There is no

disclosure in Kobayashi that the filter disclosed is suitable for surface filtration of dirt particles as is done in the present claimed invention.

In the Office Action the Examiner refers to column 4, lines 59-65 of Kobayashi as teaching dust removal. However, the Examiner overlooks the statement given in lines 57 and 58 which make it clear that dust particles are removed by other layers which are upstream or downstream. The filter of Kobayashi cannot be considered as being the claimed water-repellant membrane filter arranged in an air inlet for surface filtration of dirt particles and water, but merely a filter that consists of multiple layers of filter materials, each providing different filter functionalities (water repellent (A), water absorbent (B) and dust removing). Hence, the use of the filter assembly in the arrangement of Ghorbani does not lead to the membrane filter of the present claimed invention.

As discussed above, there is no disclosure that Kobayashi provides a filter which is capable of surface filtration of dirt particles as is done by the present claimed invention. Therefore, it is submitted that one of ordinary skill in the art would not have been lead to replace the dust particle screen 34 of Ghorbani and the filter sheet 38 including hydrophobic material 40 in Ghorbani with the Kobayashi filter since there is no teaching that Kobayashi filters both dirt particles and water from the air. Therefore, it is submitted that claims 1-5, 7-8, 10-14 and 16-17 patentably distinguish over the prior art.

Information Disclosure Statement

An information Disclosure Statement is being submitted herewith in order to submit documents for the Examiner's consideration. It is requested that the documents be considered and made of record by the Examiner.

Summary

It is submitted that none of the references, either taken alone or in combination, teach the present claimed invention. Thus, claims 1-8, and 10-19 are deemed to be in a condition suitable for allowance. Reconsideration of the claims and an early notice of allowance are earnestly solicited.

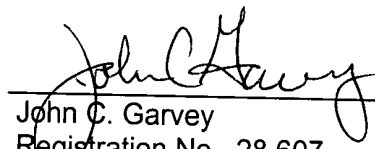
Finally, if there are any formal matters remaining after this response, the Examiner is requested to telephone the undersigned to attend to these matters.

If there are any additional fees associated with filing of this Amendment, please charge the same to our Deposit Account No. 19-3935.

Respectfully submitted,

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Date: 4-17-03

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